Course: PHYS572 Fundamentals of Quantum Optics
Term: Spring 2021
Room: BRK 103
Class: MWF, 1:00-1:50pm

Instructor Contact Information

Instructor: Han Pu
Office: BRK 309
Email: hpu@rice.edu
Office Hours: In person and remote office hours are by appointment only.

Course Objectives and Learning Outcomes

In Phys572, we will cover the following topics: Quantization of light field, quantum states of light, optical coherence theory, atom-photon interaction (quantum and semi-classical theory), system-reservoir coupling, laser cooling and trapping.

Topic Learning Outcomes: By the end of the course, students will be able to
(1) understand the basic quantum properties of light
(2) understand fundamentals of light-matter interaction

Delivery Method

The current plan is that course will be delivered in person. However, for the first two weeks, the lectures will be conducted online via zoom. The zoom lectures will be recorded and posted on Canvas in case you couldn't attend the lecture in real time.

The zoom information is as follows:
https://riceuniversity.zoom.us/j/91811641138?pwd=dS9pZlF2NEo1KzVyNWw2OWJweXYydz09

Meeting ID: 918 1164 1138
Passcode: 695118

Required Texts and Materials

There is no required textbook.

Here is a list of reference books: *Quantum Optics* (Scully and Zubairy), *Optical Resonance and Two-Level Atoms* (Allen and Eberly), *Optical Coherence and Quantum Optics* (Mandel and Wolf)

Homework, Exams and Papers

There will be roughly one homework set per week. There will be an in-class midterm exam and a final project.

Grade Policies

Homework Policy: Homework must be done under the Honor System. You are encouraged to discuss the homework problems with your PHYS 572 classmates and with the instructor, but you must write up your solutions *independently*. Of course, you must not copy from anyone else's solutions. The homework papers you hand in should be the result of your own thought and effort.

Late Policy: Late homework will be counted off 20% for each day late, unless excused by illness or some other valid reason. Late homework must be delivered to the instructor for that problem set and the student must write "Late" and the date and time on the front page.

Grading Weights:	Homework:	30%
	Midterm Exam:	30%
	Final Project:	40%

RICE HONOR CODE

In this course, all students will be held to the standards of the Rice Honor Code, a code that you pledged to honor when you matriculated at this institution. If you are unfamiliar with the details of this code and how it is administered, you should consult the Honor System Handbook at http://honor.rice.edu/honor-system-handbook/. This handbook outlines the University's expectations for the integrity of your academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process.

DISABILITY SUPPORT SERVICES

If you have a documented disability or other condition that may affect academic performance you should: 1) make sure this documentation is on file with Disability Support Services (Allen Center, Room 111 / adarice@rice.edu / x5841) to determine the accommodations you need; and 2) talk with me to discuss your accommodation needs.

TITLE IX STATEMENT

Rice University cares about your wellbeing and safety. Rice encourages any student who has experienced an incident of harassment, pregnancy discrimination or gender discrimination or relationship, sexual, or other forms of interpersonal violence to seek support through the SAFE Office. Students should be aware when seeking support on campus that most employees, including myself, as the instructor/TA are required by Title IX to disclose all incidents of non-consensual interpersonal behaviors to Title IX professionals on campus who can act to support that student and meet their needs. For more information, please visit safe.rice.edu or email titleixsupport@rice.edu.

SYLLABUS CHANGE POLICY

This syllabus is only a guide for the course and is subject to change with advanced notice.